Methods and limitations: Interim estimates of monthly cumulative influenza vaccination coverage for 2010-11 season–United States, August 2010 through February 2011.

Methods

CDC analyzed data collected September 2010 through March 2011 from 43 states and the District of Columbia for Behavioral Risk Factor Surveillance System (BRFSS) and from all 50 states and the District of Columbia for National Immunization Survey (NIS) to estimate national and state level influenza vaccination coverage for the 2010-11 influenza vaccination season.

BRFSS is an on-going state-based monthly telephone survey which collects information on health conditions and risk behaviors from ~400,000 randomly selected persons aged ≥18 years among the non-institutionalized, U.S. civilian population. BRFSS respondents were asked if they had received a 'flu' vaccine in the past 12 months, and if so, in which month and year. The median state Council of American Survey and Research Organizations (CASRO) BRFSS response rate was 54.4%. NIS is an ongoing, national landline list-assisted random-digit-dialed telephone survey of households with children who are 19-35 months or 13-17 years (NIS-Teen) at the time of interview. For children 6-18 months and 3-12 years identified during screening households for NIS and NIS-Teen, a short influenza vaccination module was added. A supplemental cellular phone sample was conducted as part of the NIS during 4th quarter 2010 and 1st quarter 2011. NIS respondents $\underline{\geq}$18 years were asked if their children had received a flu vaccination since August 2010; and if so, in which day, month and year. The NIS CASRO response rates across three quarters of data collection ranged from 51.5%-73.6% for landline and 28.5%-38.2% for cellular telephones.

Kaplan-Meier survival analysis was used to determine the cumulative influenza vaccination coverage (≥1 dose) for children 6 months – 17 years and adults ≥18 years during August 2010–February2011 using monthly interview data collected during September 2010–March 2011. BRFSS data (*n*=199,452) were used to estimate coverage for adults ≥18 years and NIS data (*n*=88,580) were used to estimate coverage for children 6 months-17 years. Coverage estimates for all persons ≥6 months was determined using combined state-level monthly estimates weighted by the age-specific populations of each state. For participants who indicated they had been vaccinated but had a missing month and year of vaccination, this information was imputed from donor pools matched for week of interview, age group, state of

residence and race/ethnicity. Results from both surveys were weighted and analyzed with SAS and SUDAAN statistical software to account for the complex survey design.

Current estimates provided are preliminary. Estimates will be updated as additional monthly BRFSS and NIS survey data become available through June 2011.

Limitations

These estimates are subject to the following limitations. First, influenza vaccination status was based on self or parental report, was not validated with medical records, and thus is subject to respondent recall bias. Second, BRFSS and NIS are telephone-based surveys that do not include households without telephone service, and BRFSS data analyzed here do not include households with cellular telephone service only. Third, response rates for both surveys were low and nonresponse bias may remain even after weighting adjustments to reflect the national population subgroup distribution and nonresponse. Fourth, combining BRFSS and NIS estimates allowed estimation of coverage for all persons ≥6 months; however, differences in survey methodology (e.g., different sampling frame, survey design, exact survey question wording, response rates and weighting) may result in different levels of bias that are averaged for this group. Fifth, BRFSS adult interview data were not available from all states for some reporting periods, so regional and national adult vaccination coverage estimates are based only on the 43 states and the District of Columbia that reported interview data through March; see individual tables for details.